

## **VRAM**

Stands for "Video Random Access Memory" and is pronounced "V-RAM." System RAM is great for loading and running programs, but when you need graphics power, VRAM is where it's at. This is the memory used to store image data that the computer displays; it acts as a buffer between the CPU and the video card. When a picture is to be displayed on the screen, the image is first read by the processor and then written to the VRAM. The data is then converted by a RAM digital-to-analog converter (RAMDAC) into analog signals that are sent to the display. Of course, the whole process happens so quickly, you don't notice it. Unlike most system RAM, VRAM chips are dual-ported, which means that while the display is reading from VRAM to refresh the currently displayed image, the processor is writing a new image to the VRAM. This prevents the display from flickering between the redrawing of images.

There are many different types of VRAM. One popular kind is called Synchronous Graphics RAM (SGRAM). It is an inexpensive type of RAM that is clock-synchronized. This means data can be modified in a single operation rather than as a sequence of read, write, and update operations. This allows background, foreground, and image fills to be handled more efficiently. Another type of VRAM is Rambus Dynamic RAM (RDRAM). It is designed by Rambus and includes a proprietary Rambus bus that speeds up the transfer of data through it. Video editing pros like this chip since it is optimized for video streaming. A third type of VRAM is Window RAM (WRAM). This high-performance VRAM is dual-ported, has about 25% more bandwidth than standard VRAM, and typically costs less. Finally, there is Multibank Dynamic RAM (MDRAM). This is also high-performance VRAM, developed by MoSys, which divides the memory into divisions of 32 KB that can be accessed individually. This makes memory transfers more efficient and increases overall performance. Another advantage of MDRAM is that it can be manufactured with just the right amount of memory for a given resolution, so it is cheaper to manufacture than most other types of VRAM.

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